

IN THE CLAIMS:

Please amend the claims as follows:

1. (currently amended) A volumetric three dimensional display device with an interactive pointer, the device comprising:

a rotating helical display screen that sweeps out a cylindrical three-dimensional display space;

a projector for projecting two-dimensional slices of a three-dimensional data set on said rotating helical display screen so as to generate a three-dimensional volumetric display on said rotating helical display screen; and

a laser pointer generating a continuously pulsed laser beam.

2. (original) The display device of Claim 1, wherein said pulsed laser beam is pulsed at a period matching a rotational period of said rotating helical display screen so that said laser beam, if said pointer is maintained in a constant orientation relative to said rotating helical display screen, strikes said rotating helical display screen at a single spatial point in said cylindrical three-dimensional display space each rotation of said rotating helical display screen.

3. (original) The display device of Claim 1, wherein said laser pointer further comprises a phase control device for controlling a phase of said pulsed laser beam such that said pulsed laser beam strikes said rotating screen at different points in said three-dimensional display space as said phase is changed.

4. (original) The display device of Claim 1, wherein said projector comprises a spatial light modulator.

5. (original) The display device of Claim 1, wherein said laser pointer further comprises an orientation sensor and said laser pointer wireless transmits a signal indicating said pointer's orientation relative to said three-dimensional display space.

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6. (original) The display device of Claim 5, wherein said display device further comprises a wireless receiver for receiving said signal indicating said pointer's orientation relative to said three-dimensional display space, wherein said received signal is provided to a central processor of said display device and said three-dimensional volumetric display is modified to indicate that section of said three-dimensional display space at which said pulsed laser beam strikes said rotating helical display screen.

7. (original) A volumetric three-dimensional display device comprising:  
a rotating helical display screen that sweeps out a cylindrical three-dimensional display space;  
a first projector for projecting two-dimensional slices of a three-dimensional data set on said rotating helical screen so as to generate a three-dimensional volumetric display on said screen;

a second projector for projecting a two-dimensional image that is superimposed on said three-dimensional volumetric display; and

a slotted plate in a projection path of said second projector, wherein said slotted plate rotates in synchronization with said rotating helical display screen.

8. (original) The device of Claim 7, wherein a portion of said two-dimensional image passing through at least one slot of said slotted plate is reflected by a mirror onto said rotating helical display screen, and wherein said first projector projecting said two-dimensional slices of said three-dimensional data set through an aperture in said mirror.

9. (original) The device of Claim 7, wherein a portion of said two-dimensional image passing through at least one slot of said slotted plate is reflected by a beamsplitter onto said rotating helical display screen, and wherein said first projector projecting said two-dimensional slices of said three-dimensional data set through said beamsplitter.

10. (currently amended) A method of providing a volumetric three dimensional display device with an interactive pointer, the method comprising the steps of:

rotating a helical display screen that sweeps out a cylindrical three-dimensional display space;

projecting two-dimensional slices of a three-dimensional data set on said rotating helical display screen so as to generate a three-dimensional volumetric display on said rotating helical

display screen; and

generating a continuously pulsed laser beam on a laser pointer.

11. (original) The method of Claim 10, further comprising the step of matching a period in which said laser beam is pulsed with a rotational period of said rotating helical display screen so that said laser beam, if said pointer is maintained in a constant orientation relative to said rotating helical display screen, strikes said rotating helical display screen at a single spatial point in said cylindrical three-dimensional display space each rotation of said rotating helical display screen.

12. (original) The method of Claim 10, further comprising the step of controlling a phase of said pulsed laser beam such that said pulsed laser beam strikes said rotating screen at different points in said three-dimensional display space as said phase is changed.

13. (original) The method of Claim 10, further comprising the step of transmitting a signal indicating said pointer's orientation relative to said three-dimensional display space.

14. (original) The method of Claim 13, further comprising the step of receiving said signal indicating said pointer's orientation relative to said three-dimensional display space, wherein said received signal is provided to a central processor of said display device and said three-dimensional volumetric display is modified to indicate that section of said three-

dimensional display space at which said pulsed laser beam strikes said rotating helical display screen.

15. (original) A method of providing a volumetric three-dimensional display device, comprising the steps of:

rotating a helical display screen that sweeps out a cylindrical three-dimensional display space;

projecting two-dimensional slices of a three-dimensional data set on said rotating helical screen so as to generate a three-dimensional volumetric display on said screen;

projecting a two-dimensional image that is superimposed on said three-dimensional volumetric display; and

rotating a slotted plate in a projection path of said two-dimensional image, wherein said slotted plate rotates in synchronization with said rotating helical display screen.

16. (original) The method of Claim 15, wherein a portion of said two-dimensional image passing through at least one slot of said slotted plate is reflected by a mirror onto said rotating helical display screen, and wherein said two-dimensional slices of said three-dimensional data set passes through an aperture in said mirror.

17. (original) The method of Claim 15, wherein a portion of said two-dimensional image passing through at least one slot of said slotted plate is reflected by a beamsplitter onto said

rotating helical display screen, and wherein said first projector projecting said two-dimensional slices of said three-dimensional data set through said beamsplitter.

18. (previously presented) A method of providing a volumetric three-dimensional display device, comprising the steps of:

rotating a helical display screen that sweeps out a cylindrical three-dimensional display space;

projecting two-dimensional slices of a three-dimensional data set on said rotating helical screen so as to generate a three-dimensional volumetric display on said screen;

selectively projecting a two-dimensional image that is superimposed on said three-dimensional volumetric display, wherein said selective projection of said two-dimensional image is synchronized with rotation of said rotating helical display screen.

19. (previously presented) The method of Claim 18, further comprising performing said selective projection of said two-dimensional image by rotating a slotted plate in between a projector of said two-dimensional image and said display screen, wherein said slotted plate is rotated in synchronization with rotation of said rotating helical display screen

20. (previously presented) The method of Claim 19, wherein a portion of said two-dimensional image passing through at least one slot of said slotted plate is reflected by a mirror onto said rotating helical display screen, and wherein said two-dimensional slices of said three-dimensional data set passes through an aperture in said mirror.

21. (previously presented) The method of Claim 19, wherein a portion of said two-dimensional image passing through at least one slot of said slotted plate is reflected by a beamsplitter onto said rotating helical display screen, and wherein said first projector projecting said two-dimensional slices of said three-dimensional data set through said beamsplitter.

22. (currently amended) A volumetric three dimensional display device with an interactive pointer, the device comprising:

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a rotating helical display screen that sweeps out a cylindrical three-dimensional display space;

a projector for projecting two-dimensional slices of a three-dimensional data set on said rotating helical display screen so as to generate a three-dimensional volumetric display on said rotating helical display screen; and

a hand-held laser pointer generating a continuously pulsed laser beam which a user directs at said rotating display screen to selectively indicate a point on the three-dimensional volumetric display.

23. (previously presented) The display device of Claim 22, wherein said pulsed laser beam is pulsed at a period matching a rotational period of said rotating helical display screen so that said laser beam, if said pointer is maintained in a constant orientation relative to said rotating helical display screen, strikes said rotating helical display screen at a single spatial point in said cylindrical three-dimensional display space each rotation of said rotating helical display screen.

24. (previously presented) The display device of Claim 22, wherein said laser pointer further comprises a phase control device for controlling a phase of said pulsed laser beam such that said pulsed laser beam strikes said rotating screen at different points in said three-dimensional display space as said phase is changed.

25. (previously presented) The display device of Claim 22, wherein said projector comprises a spatial light modulator.

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26. (previously presented) The display device of Claim 22, wherein said laser pointer further comprises an orientation sensor and said laser pointer wireless transmits a signal indicating said pointer's orientation relative to said three-dimensional display space.

27. (previously presented) The display device of Claim 26, wherein said display device further comprises a wireless receiver for receiving said signal indicating said pointer's orientation relative to said three-dimensional display space, wherein said received signal is provided to a central processor of said display device and said three-dimensional volumetric display is modified to indicate that section of said three-dimensional display space at which said pulsed laser beam strikes said rotating helical display screen.

28. (new) A volumetric three dimensional display device with an interactive pointer, the device comprising:



a rotating helical display screen that sweeps out a cylindrical three-dimensional display space;

a projector for projecting two-dimensional slices of a three-dimensional data set on said rotating helical display screen so as to generate a three-dimensional volumetric display on said rotating helical display screen; and

a laser pointer generating a pulsed laser beam;

wherein said pulsed laser beam is pulsed at a period matching a rotational period of said rotating helical display screen so that said laser beam, if said pointer is maintained in a constant orientation relative to said rotating helical display screen, strikes said rotating helical display screen at a single spatial point in said cylindrical three-dimensional display space each rotation of said rotating helical display screen.

29. (new) A volumetric three dimensional display device with an interactive pointer, the device comprising:

a rotating helical display screen that sweeps out a cylindrical three-dimensional display space;

a projector for projecting two-dimensional slices of a three-dimensional data set on said rotating helical display screen so as to generate a three-dimensional volumetric display on said rotating helical display screen; and

a laser pointer generating a pulsed laser beam;

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wherein said laser pointer further comprises a phase control device for controlling a phase of said pulsed laser beam such that said pulsed laser beam strikes said rotating screen at different points in said three-dimensional display space as said phase is changed.

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